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QUESTION OF ANTARCTICA

State of the environment in Antarctica

Report of the Secretary-General

CONTENTS

Chapter		Paragraphs	Page
I.	INTRODUCTION	1 - 7	3
II.	ANTARCTICA'S INFLUENCE ON THE GLOBAL ENVIRONMENTAL SYSTEM	8 - 11	4
III.	SCIENTIFIC RESEARCH IN ANTARCTICA AND PROTECTION OF THE ANTARCTIC ENVIRONMENT	12 - 62	4
	A. General observations	12 - 17	4
	B. Project concerning the Antarctic sea-ice zone interactions and feedbacks within the global geosphere-biosphere system	18 - 27	5
	1. Objectives	21	5
	2. Current status and future plans	22 - 27	6
	C. Project devoted to global palaeoenvironmental records from the Antarctic ice sheet and marine and land sediments	28 - 31	7
	1. Objectives	29	7
	2. Current status and future plan	30 - 31	7

CONTENTS (continued)

Chapter		Paragraphs	Page
D.	Project devoted to the mass balance of the Antarctic ice sheet and sealevel	32 - 41	8
	1. Objectives	35	8
	2. Current status and future plan	36 - 41	9
E.	Project related to Antarctic stratospheric ozone, tropospheric chemistry, and the effect of ultraviolet radiation on the biosphere	42 - 50	10
	1. Objectives	43	10
	2. Current status and future plans	44 - 50	10
F.	Project related to the role of the Antarctic in biogeochemical cycles and exchanges; atmosphere and ocean	51 - 55	11
	1. Objectives	53	12
	2. Current status and future plans	54 - 55	12
G.	Project related to environmental monitoring and detection of global change in Antarctica	56 - 62	12
	1. Objectives	58	13
	2. Current status and future plans	59 - 62	13
IV.	CONCLUDING REMARKS	63 - 64	14
Annex.	Replies from Governments		16

I. INTRODUCTION

1. The General Assembly, by its resolution 46/41 A of 6 December 1991, requested the Secretary-General, inter alia, to "monitor and gather information within existing resources on the state of the environment in Antarctica and to submit an annual report to the General Assembly".

2. In its resolution 47/57 of 9 December 1992, the General Assembly welcomed the report of the Secretary-General, on the state of the environment in the Antarctica, and requested the Secretary-General, "to explore the possibilities of publishing, as official documents of the United Nations, extracts of data received from the various organizations in the preparation of future annual reports, within existing resources".

3. In pursuance of the aforementioned resolution 47/57, the Secretary-General has explored the possibilities of publishing, as official documents of the United Nations, the above-indicated extracts. However, in view of the financial situation of the organization, it would not be possible to publish these documents this year.

4. On 16 March 1993, in accordance with the above resolutions, the Secretary-General addressed a note verbale to Member States, requesting them to submit not later than 30 May 1993 any information they were prepared to make available. Letters were sent to the Antarctic Treaty Consultative Parties, drawing further attention to the requests specified in General Assembly resolution 47/57.

5. Letters were sent also to the relevant specialized agencies, programmes, organs, organizations and bodies of the United Nations system and to relevant intergovernmental and non-governmental bodies, inviting them to submit information and comments not later than 30 May 1993.

6. As at 1 September 1993, replies had been received from two Member States, including one acting on behalf of the States Parties to the Antarctic Treaty (see annex). Information, including scientific data, opinions and conclusions, was also received from the following organizations: the International Civil Aviation Organization (ICAO), the International Maritime Organization (IMO), the United Nations Environment Programme (UNEP), the United Nations Educational, Scientific and Cultural Organization (UNESCO) the World Meteorological Organization (WMO) the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), the International Whaling Commission (IWC), the Scientific Committee on Antarctic Research (SCAR), the Scientific Committee on Problems of the Environment (SCOPE), the Fridtjof Nansen Institute (Norway) and the National Institute of Polar Research (Japan). The information provided has been taken into account in the preparation of the present report.

7. It should be indicated that certain aspects of the environmental issues addressed in this report were also dealt with at length in the Secretary-General's reports on the question of Antarctica submitted to the General Assembly at its thirty-ninth session (A/39/583), forty-first session (A/41/722), forty-sixth session (A/46/590) and forty-seventh session (A/47/624).

II. ANTARCTICA'S INFLUENCE ON THE GLOBAL ENVIRONMENTAL SYSTEM

8. Contemporary science provides sufficient data about the substantial role Antarctica plays in the global environmental system. As noted in the report prepared by SCAR, Antarctica plays a critical role in global change, since major interactions in the region between the atmosphere, ice, oceans and biota affect the entire global system through feedbacks, biogeochemical cycles, deep ocean circulation, atmospheric transport of energy and pollutants and changes in ice mass balances. 1/

9. The most important among the global change effects in the polar regions are the ozone hole over Antarctica and the "greenhouse effect", which might result in sea-ice and ice-sheet melting and, consequently a global sealevel rise. 2/

10. The Antarctic ozone depletion annual cicle phenomenon has been perceived for several years. It occurs during the Antarctic spring (September/October) and is determined to be man-induced. 3/

11. Although most scientists believe that we are at the beginning of new global climate change, they also indicated that, for the first time, this very evident change was created by man and that mankind has interfered with a very complex natural system without knowing very much about it. 4/ In that sense, Antarctica is, in many respects, unique as a source of information about global changes taking place on Earth.

III. SCIENTIFIC RESEARCH IN ANTARCTICA AND PROTECTION OF THE ANTARCTIC ENVIRONMENT

A. General observations

12. As noted in the documentation received from SCAR, this organization has undertaken a major scientific initiative by developing a programme of global change research in the Antarctic. This programme forms six core projects and will be coordinated by a new SCAR Group of Specialists on Global Change and the Antarctic. There will be a single Regional Research Centre (RRC), where a Project Coordinator will be responsible for the day-to-day running of the programme. The Project Coordinator will report to a specially designated Group of Specialists.

13. The Regional Research Sites (RRS) will be based on existing national research institutions with relevant expertise in specific fields and those will be linked to the multi-disciplinary RRC, following the International Geosphere-Biosphere Programme (IGBP) Global Change System for Analysis, Research and Training (START) model.

14. SCAR will be working in close cooperation with the national operators in the Antarctic through the Council of Managers of National Antarctic Programmes (COMNAP).

15. SCAR further indicated that an important aspect of the programme will be the establishment of active links with other relevant international scientific programmes. The scientific results will be used to ensure global coverage of

those programmes as appropriate. Data from other programmes, including data gathered by orbiting satellites, could be incorporated into the Antarctic projects to complement surface observations in the Antarctic. 5/

16. The organization and costs of the individual components of the core projects will be borne by the national operators as part of their national scientific programmes. A large part of the costs of coordination by the Group of Specialists will be borne by SCAR.

17. As noted above, there are six Antarctic core projects, all of which are directly connected with research on the Antarctic environment.

B. Project concerning the Antarctic sea-ice zone interactions and feedbacks within the global geosphere-biosphere system

18. The dynamics and thermodynamics of the Antarctic sea-ice cover are intricately linked with the ocean-atmosphere exchange of heat, water and gas. Thus Antarctic sea ice is a major element in the global climate system and is therefore a sensitive indicator of the effects of the global climate change on physical and biological systems.

19. The sea-ice region strongly influences the Antarctic bottom-waters and other Antarctic water masses, which are major components in the water circulation in the oceans of the world. The exchange of gases between the atmosphere and the ocean in the sea-ice zone also plays a central role in the global cycle of atmospheric circulation, particularly with regard to the ventilation of the deep ocean. Changes of deep ocean temperature, salinity and concentration of dissolved gases could act as an important feedback in global climate. The Antarctic sea-ice zone is also a major habitat for marine biota.

20. The study of the gas and chemical exchanges between the atmosphere, the ocean and the marine biosphere is necessary to understand the global biogeochemical cycle. The interactions and feedbacks which can result from the global climate change require a multi-disciplinary approach including studies on the atmosphere, ice, ocean, sediments and biota.

1. Objectives

21. The objectives of the first core project are as follows:

(a) To understand the dynamic and thermodynamic processes determining the sea-ice mass and thickness distribution;

(b) To determine the role of Antarctic sea ice in marine biotic systems;

(c) To understand atmosphere-ice-ocean interaction;

(d) To understand clouds and cloud feedback;

(e) To understand deep- and bottom-water formation;

(f) To investigate aspects of gas exchange within the sea-ice zone which are relevant to global change;

(g) To understand sea ice-ice shelf/sheet interactions;

(h) To define the temporal and spatial variability of sedimentation of biogenic material from the sea-ice zone.

2. Current status and future plans

22. As noted in the documents of SCAR, a number of studies are planned in the Southern Ocean under the WOCE Core Project 2 as part of the World Ocean Circulation Experiment (WOCE), which is a large-scale international research effort in which scientists from 40 nations are taking part. WOCE Core Project 2 comprises, inter alia the Subsurface Float Programme; about 50 floats will be deployed until the end of 1993 in the ice-free areas.

23. The Programme for International Polar Oceans Research (PIPOR) was developed under the auspices of the European Space Agency to study the nature and dynamics of sea ice in both polar regions using the ERS-1 satellite, launched in July 1991, and other forthcoming radar satellites, such as the Japanese JER, S-1 and the Canadian Radarsat. In the Antarctic, some 20 projects have been approved using the C-band SAR (Synthetic Aperture Radar) aboard ERS-1 to measure velocity vectors, ice concentration, and ice-type distribution.

24. Currently operating systems, with the expectation of continued use for ice monitoring, include the Special Sensor Microwave/Imager (SSM/I) and adaptation for ice mapping of visible and infrared receivers on meteorological satellites.

25. In another endeavour, in accordance with the International Antarctic Drifting Buoy Project, data buoys measuring sea-ice movement and surface meteorological parameters have been deployed within the Antarctic Seasonal sea-ice zone for more than ten years. The Working Group on Sea Ice of the World Climate Research Programme (WCRP) has proposed a coordinated international effort to deploy a network of 20 or more buoys per year around the Antarctic, and the establishment of a common data archive.

26. The WCRP Working Group on Sea Ice has proposed a network of about 25 upward-looking sonar buoys (ULS) around the continent to provide overall estimates of the Antarctic ice thickness distributions. Several buoys have been deployed in the Weddell Sea within the German national programme.

27. A Joint Global Ocean Flux Study (JGOFS) regional study in the Southern Ocean has already been planned in some detail. Its first phase will be undertaken during the period 1992-1995. The main focus of the programme is the sea-ice-associated system.

C. Project devoted to global palaeoenvironmental records from the Antarctic ice sheet and marine and land sediments

28. As stated in the report of SCAR, palaeoenvironment data serve to compensate for the limited time span and geographical extent of direct measurements of climate change, compared with crucial elements of natural variability. The detailed records derived from ice cores and some sediments may show annual changes on time scales up to a few thousand years. 6/ Drill cores and onshore rock exposures contain a much longer record of global climate change over 4.5 billion years. There exists the possibility of perceiving the limits of natural variability and its effects on past ecosystems, providing a perspective on human impact and vulnerability. The palaeoenvironmental record, as indicated in the report of SCAR, is the key to describing and understanding past changes and deducing the mechanisms acting at the same time. It is very important to build this into predictive models of climate change. 7/

1. Objectives

29. The objectives of the Second Core Project studies are the following:

(a) Climatic change - response and forcing factors;

(b) Past climate, mass balance of the ice sheet and sealevel;

(c) Rapid and abrupt global changes;

(d) Characterization of specific climatic events;

(e) Bipolar interactions;

(f) Polaro-atmosphere and polaro-ocean interactions;

(g) Ice-core records of atmosphere chemistry;

(h) Anthropogenic influences on the global environment;

(i) Modelling of the palaeoenvironment.

2. Current status and future plans

30. A limited number of deep-drilling programmes are currently under way, and several others are being planned cooperatively. The deep drilling will be supplemented by a proposed internationally coordinated surface sampling and shallow-drilling programme entitled the "International Trans-Antarctic Scientific Expedition". The European Programme for Ice Coring in Antarctica (EPICA) proposed to analyse ice cores drilled in two complementary regions of East and West Antarctica. The project has been formulated in several phases and will extend over a decade.

31. Around 70 holes have been drilled in the Antarctic margin and in the surrounding deep ocean since 1972 under the aegis of several international and

national programmes. The Antarctic Offshore Acoustic Stratigraphy Project (ANTOSTRAT) has been created for further scientific drilling in Antarctica. ANTOSTRAT has also established a seismic data library for data collected by many countries working around the Antarctic margin. A Group of Specialists on Cenozoic Palaeoenvironment of the Southern High Latitudes (GOSC) is now working to establish an international group to develop a comprehensive programme for further deep drilling over the next decade, in conjunction with projects of the Ocean Drilling Programme (ODP).

D. Project devoted to the mass balance of the Antarctic ice sheet and sealevel

32. As noted in the Secretary-General's report of 1991 (A/46/590) the Antarctic ice sheet contains enough water to raise the world-wide sealevel by up to 60 metres, were it all to melt. It is also well known that the amount of snow annually deposited on the grounded ice is equivalent to 5 mm of global sealevel. Thus, as the report of SCAR indicates, the Antarctic ice sheet might be a major factor to the present 1-2 mm per year rise of the global sealevel, but uncertainties remain on this issue. 8/

33. Despite all available measurements of snow accumulation, ice velocities, basal melting and iceberg discharge, the report of SCAR indicates that it is still not known for certain whether the ice sheet is growing or shrinking, although the best estimates suggest a slow growth. 9/ At the same time there are many reasons for concern about the stability of the marine-based portion of the ice sheet.

34. Available data indicate that further enhanced greenhouse warming will affect the mass balance of the ice sheet and the warming of the floating ice shelves, which, in turn, could result in a faster flow of the grounded ice into the ocean. The result will be a further rise of the sealevel. Thus, only a better understanding of the atmosphere ice-ocean processes and ice dynamics could give a realistic picture of changes in the global sealevel.

1. Objectives

35. The objectives of this core programme are:

(a) To determine the present distribution of surface elevation change on the Antarctic ice sheet;

(b) To determine the values of the mass balance components, calculate the net mass balance of the ice sheet and determine how that net balance is distributed between the grounded and floating portions of the ice sheet;

(c) To determine how the Antarctic ice sheet has changed during the last 20,000 years and what changes are continuing;

(d) To identify and evaluate the important processes that affect the moisture flux across the Antarctic periphery and determine the patterns of deposition on the ice sheet;

(e) To identify and evaluate the physical controls on the motion and areal extent of ice streams and outlet glaciers;

(f) To quantify the interaction between the ocean and the ice shelves and how that interaction varies in space and time, and to determine the implications of that interaction for the discharge of grounded ice;

(g) To develop the capability for predicting from various climate scenarios, the change in ground ice volume that would occur over the next decades to several centuries.

2. Current status and future plans

36. There are currently a number of multilateral scientific programmes related to Antarctic mass balance and sealevel, as well as some regional studies carried out by individual nations.

37. The existing programmes include: the West Antarctic Ice Sheet Initiative (WAIS), Filchner-Ronne Ice Shelf Programme (FRISP), Ice-Sheet Research with ERS-1 (ISRES-1), the IOC-sealevel measurements in Antarctic and the European Ice-Sheet Modelling Initiative (EISMINT). The WAIS programme is carried out by the United States and is directed to predict the future behaviour of the West Antarctic ice sheet. The study also will be directed towards understanding the current state, internal dynamics, interaction and history of this local environmental system.

38. The scientists, mainly from Germany, Norway, the Russian Federation and the United Kingdom have been cooperating in the FRISP programme since 1983. The programme includes studies on ice shelves and associated oceanographic systems, in particular the Filchner-Ronne ice shelf and the southern Wedell sea.

39. The European Space Agency's ERS-1 satellite, was launched in July 1991 and covered a substantial portion of Antarctica. ISRERS-1 is an international cooperation programme of glaciologists, who plan a wide range of studies of the marginal ice sheet and surface temperatures.

40. The International Trans-Antarctic Scientific Expedition is scheduled to start in 1993. It will develop a programme of sampling every 50-100 km over some 20,000 km of profile lines. As a result, the scientists will have a map of several environmental parameters, including the accumulation rate for the last 100-200 years.

41. The Global Energy and Water-Cycle Experiment (GEWEX) initiated by the World Climate Research Programme, is planned to observe, understand, and model the hydrological cycle and energy fluxes in the atmosphere on land and in the upper ocean. The goal of GEWEX, as indicated in the report of SCAR, is to reproduce and predict variations of the global hydrological processes and water resources and their response to changes in the environment.

E. Project related to Antarctic stratospheric ozone, tropospheric chemistry, and the effect of ultraviolet radiation on the biosphere

42. It has already been noted that human activities are perturbing the Antarctic atmosphere. SCAR particularly noted in its report that Antarctica plays a unique role in global atmospheric composition and global change, since some atmospheric perturbations, such as the ozone hole, has been pronounced in polar regions. 10/ There are evidences connecting the ozone depletion with the use of chlorofluorocarbons (CFCs), but the depletion of the Antarctic ozone is far from being fully understood. Important questions remain unclear regarding the seasonal character of the depletion. Some studies also have shown that increased levels of ultraviolet radiation (UVB) may have a negative effect on the primary production in community structure, because they affect the phytoplankton and the ice algae, which constitute the base of the Antarctic marine food chain. Any changes in the seasonal productivity of those organisms have a very negative effect on the whole Antarctic marine ecosystem.

1. Objectives

43. The objectives of this programme are:

(a) To investigate changes in the composition and structure of the Antarctic Stratosphere;

(b) To analyse the chemistry and microphysics of the ozone hole;

(c) To determine the chemical composition of the Antarctic troposphere;

(d) To determine the effect of increased UV radiation on Antarctic aquatic and terrestrial ecosystems.

2. Current status and future plans

44. A network of surface observatories has to be developed and continued at Antarctic stations inside and outside the ozone-depleted region, in order to measure total ozone and trace gases in the atmosphere, aerosol concentrations and cloud cover.

45. A number of instruments for necessary measurements at night and during the winter darkness have already been installed in the Antarctic. Additional instruments will be operated within the framework of a network for the Detection of Stratospheric Change.

46. Long-term monitoring of trace gases and aerosol composition provide an essential database for studies of global trends. Several Antarctic Stations have long-term programmes monitoring important trace gases (ozone, active nitrogen species, methane, radon etc.) and aerosol composition. These long-term ground-based measurements will help us to understand key features of global atmospheric change.

47. Ultraviolet spectrometers have already been deployed in the Antarctic region, but some are intended only for the determination of atmospheric constituents, and therefore measure only relative spectral fluxes. For biological applications, as noted in the report of SCAR, present-day instruments do not have adequate sensitivity and accuracy at the very low levels of irradiance received by the surface at wavelengths below 300 mm, and their absolute calibration is unsatisfactory.

48. Satellite sensors provide a daily spatial coverage and stability which is vital for many studies of the Antarctic ozone layer. Current and planned satellite measurements include, inter alia:

(a) Total Ozone Mapping Spectrometer (TOMS) and Solar Brackscattered Ultraviolet (SBUV) instruments for monitoring the total ozone with some vertical profile information. Continuity of these programmes is critical to documenting future changes in stratospheric ozone in and around Antarctica;

(b) The Upper Atmosphere Research Satellite (UARS) was launched in September 1991 to probe the ozone layer and many of the constituents that affect it, including chlorine monoxide (ClO). UARS remote atmospheric sensors will make comprehensive measurements of wind, temperature, pressure and gas special concentrations throughout the stratosphere;

(c) The Earth Observing System is a planned space-ozone system of measurements that will do much to further research on ozone and atmospheric chemistry and trace gas transport. This international project is scheduled to be launched in the late 1990s;

(d) The Global Ozone Monitoring Experiment will be launched on ERS-2 in the summer of 1995, and will measure ozone and trace gases by UV-visible absorption spectroscopy.

49. The Biological Investigations of Terrestrial Antarctic Systems (BIOTAS) international programme addresses the effects of UV on terrestrial microbes and plants. Studies on the effect of UV on Antarctica biota are also being conducted by various national groups.

50. Future international effort may be developed under the auspices of the planned SCAR-EASIZ and Southern Ocean-Global Ecosystem Dynamics (SO-GLOBEC) (marine) programmes and BIOTAS (terrestrial) programme. Both marine programmes would be expected to commence in the second half of the 1990s.

F. Project related to the role of the Antarctic in biogeochemical cycles and exchanges; atmosphere and ocean

51. The Southern Ocean, according to the report of SCAR, defined as the part of the World Ocean situated within the Subtropical Convergence, comprises more than 20 per cent of the world ocean. As for global change, the Southern Ocean plays a special role in some aspects of the global cycles of carbon (C) and related biogenic elements (N, P, Si). 11/ The warm deep-water upwelling at the Antarctic Divergence and the Antarctic bottom-water formation are two major

processes that govern the cycles of carbon and biogenic elements in the Southern Ocean.

52. Some scientists believe that oceanographically the Antarctic is the "centre of the universe", since all of the ocean basic water exchange originates there and most of the deep water characteristics of the world ocean are formed in the Antarctic Ocean. The world's ocean basins are filled with Antarctic bottom water below a water depth of approximately 4 km, and the Southern Ocean therefore is considered as an ocean critical for global circulation. Any changes in the surface waters, or the production of deep waters in the Antarctic, will eventually affect the entire global ocean. 12/

1. Objectives

53. The objectives of this programme are:

(a) To determine the sources, sinks, and transport of gases and trace chemicals in the Antarctic troposphere and stratosphere;

(b) To determine the role of the oceans, sea, ice and biosphere in biogeochemical cycles;

(c) To determine the exchange between surface, deep water and sediments;

(d) To predict the response of biogeochemical processes to natural and anthropogenic perturbations, in particular those related to climate change.

2. Current status and future plans

54. The International Global Atmospheric Chemistry (IGAC) planned some programmes which have global coverage and are seen as being pertinent to the role of Antarctica in biogeochemical cycles. There are two programmes related to the role of polar regions in changing atmospheric composition. The first, the Polar Atmospheric Chemistry Programme, is presently active only in the Arctic. The second, the Polar Air-Snow Experiment, seeks to establish the relationship between atmospheric chemical composition and that of glacier ice in the central Antarctic plateau. This programme will be realized during one year from Amundsen-base.

55. So-GLOBER is planning some programmes related, inter alia, to Zooplankton, benthos etc. The activities under these programmes will start in 1995 or 1996 and will continue for three years.

G. Project related to environmental monitoring and detection of global change in Antarctica

56. According to the documentation of SCAR, climate varies over a wide spectrum of time scales, from interannual changes to the much slower processes that involve the Earth's orbital parameters, continental drift and solar aging. The main concern now focuses on humanity's ability to cause additional changes

through the increasing concentration of greenhouse gases and through other anthropogenically induced perturbations.

57. In order to answer the many questions raised by the global change issue, it is essential to detect changes in the Earth systems that are occurring now and that have occurred in the past. Detection of changes in the Antarctic is an essential part of a global change strategy, since various components of the Antarctic and Subantarctic environment may be sensitive to global changes.

1. Objectives

58. The objectives of this programme are data acquisition and monitoring of important physical, chemical and biological parameters sensitive to global change, such as:

(a) Surface temperature (ocean and land);

(b) Atmospheric temperature: radiative and energy fluxes;

(c) Atmospheric characteristics and dynamics;

(d) Atmospheric composition;

(e) Ecosystem sensitivity and indicator species;

(f) Surface hydrology and microenvironment;

(g) Land ice and ice shelf mass balance and sealevel;

(h) Sea-ice conditions and ocean circulation.

2. Current status and future plans

59. At present there are 37 stations of SCAR nations operating in the Antarctic. The disciplines involved in detection and prediction of change at research stations of all are summarized in the annual reports of members of SCAR to the organization.

60. Many of the anticipated changes in polar regions would be detectable from time series of satellite data. A number of receiving stations around Antarctica are already established or will start operating within the next years. A major contribution to the monitoring of changes over the polar regions will be the Earth Observing System (EOS) which will start at the beginning of the next century.

61. The following systems are currently operational:

(a) Automatic Weather Stations (AWS);

(b) Automatic Geophysical Observatories (AGOs);

(c) International Antarctic Ice Drifting Buoy Programme;

(d) Antarctic Ice Thickness Monitoring Programme;

(e) Global Acoustic Transmission Experiment is in preparation.

Data from these systems, however, are not presently coordinated or centrally stored.

62. The biological programmes directed at monitoring and detection of change in Antarctica, inter alia, include:

(a) The programme of Antarctic Marine Ecosystem Research at the Ice Edge Zone, which addresses the interface between the sea-ice communities and the open ocean in a highly productive zone where stored biomass is released into the water column;

(b) The programme of Ecology of the Antarctic Sea-Ice Zone which addresses the ecology of the Antarctic sea-ice zone, particularly the role of the coastal sea-ice system under the auspices of the SCAR SCOR group of Specialists on Southern Ocean Ecology;

(c) The programme of the Southern Ocean Joint Global Ocean Flux Study, which aims to model the biogeochemistry of carbon and related biogenic elements. During Phase 1 (1992-1995), regional studies will be conducted at national bases;

(d) The Biological Investigations of Terrestrial Antarctic Systems programme focuses on the colonization process and creation of a transient or long-term propagule bank by transoceanic or local input of aerobiota.

IV. CONCLUDING REMARKS

63. In our time, which has as never before shown an interdependence between human activities and the state of the environment, the effective actions aimed at establishing the harmonious relations between nature and man has become very important. Within the framework of these interrelations the cooperation between various international organizations and States, inter alia, in the scientific research of the Antarctic ecosystems became increasingly significant given the paramount value of the Antarctic in the global environment. This was, inter alia, recognized by the United Nations Conference on Environment and Development - the Earth Summit - held at Rio de Janeiro in June 1992.

64. Documentation received from SCAR and other international organizations and organs involved in Antarctic research has also shown that scientists may find the relevant ways and forms of cooperation in solving complicated scientific puzzles in the interests of all mankind.

Notes

1/ Report of the United Nations from the Scientific Committee on Antarctic Research on the Role of the Antarctic in Global Change: An International Plan for a Regional Research Programme, p. 1.

2/ Ibid., p. 2.

3/ Antarctica: the Environment and the Future: Transcript of an International Conference, Geneva, 23-24 April 1992, Gordon Mudge, ed., 1992, p. 16.

4/ Ibid., p. 22.

5/ 1993 Report to the United Nations from the Scientific Committee on Antarctic Research on the State of the Antarctic Environment, p. 2.

6/ Report to the United Nations from the Scientific Committee on Antarctic Research on the Role of the Antarctic in Global Change, p. 13.

7/ Ibid., p. 13.

8/ Ibid., p. 17.

9/ Ibid.

10/ Ibid., p. 24.

11/ Ibid., p. 28.

12/ Antarctica: the Environment and the Future, op. cit., p. 27.

Annex

[Original: English]

[28 May 1993]

REPLIES FROM GOVERNMENTS

Italy*

1. The General Assembly's resolution refers, in particular, to the question of the state of the environment in Antarctica and to the significant impact that Antarctica exerts on the global environment and ecosystems. The Antarctic Treaty Parties are aware of the need for concerted international action to protect the Antarctic environment from external disturbances, which could accelerate serious global environmental changes. As the countries active in the region, they have developed measures, and will continue to develop measures, to protect the fragile Antarctic environment from the impact of the limited human activity within the region. Evidence of this concern is shown by the adoption and signature, in October 1991, of the Protocol on Environmental Protection to the Antarctic Treaty, and the further work done since then to extend the scope of the Protocol and to ensure compliance with its provisions. The Protocol, which is an integral part of the Antarctic Treaty, designates Antarctica as a natural reserve devoted to peace and science in recognition of the continent's global importance. It establishes a comprehensive, legally binding regime, which includes the prohibition of activities relating to mineral resources other than scientific research, and requires, in particular, that all human activities in Antarctica be subject to environmental assessment procedures. This regime ensures that activities undertaken by States Parties in Antarctica are consistent with the protection of the Antarctic environment and its dependent and associated ecosystems.

2. It will be recalled that, at the United Nations Conference on Environment and Development (UNCED) in June 1992, an agreement was reached on the wording concerning Antarctica in Chapter 17, section E, of "Agenda 21", entitled "Addressing critical uncertainties for the management of the marine environment and climate change". As a result, paragraph 17.104 reads as follows:

> "In recognition of the value of Antarctica as an area for the conduct of scientific research, in particular research essential to understanding the global environment, States carrying out such research activities in Antarctica should, as provided for in Article III of the Antarctic Treaty, continue to:
>
> (a) Ensure that data and information resulting from such research are freely available to the international community;
>
> (b) Enhance access of the international scientific community and specialized agencies of the United Nations to such data and information, including the encouragement of periodic seminars and symposia".

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* On behalf of the States Parties to the Antarctic Treaty.

3. Given the indispensable contribution that scientific research in Antarctica makes to the understanding of global environmental problems, including prediction of climate change, the Antarctic Treaty Parties will, in the spirit of the Rio Conference, continue to make freely available the results of their research in Antarctica. The Antarctic States Parties reiterate their invitation to other States to accede to the Antarctic Treaty and to participate in these scientific research activities.

4. Further, on the distribution of information, the final report of the Seventeenth Antarctic Treaty Consultative Meeting, held in Venice from 11 to 20 November 1992, reflects the results of the meeting, some of which are of special importance. In particular, an understanding among the Consultative Parties was reached in Venice on the desirability of establishing a secretariat for the Antarctic Treaty, and on a preliminary text concerning its functions, composition, financing and legal status. In addition, some work has been done to advance the establishment of the Committee for Environmental Protection envisaged under Article 11 of the 1991 Madrid Protocol, by drawing up draft rules of procedures to that end. Immediately after publication, which is expected to take place within the next few weeks, two English-language copies of the report on the Venice meeting will be sent to the Secretary-General of the United Nations.

5. As to the question raised by paragraph 4 of General Assembly resolution 47/57 of 9 December 1992, the Permanent Representative of Italy has the honour to recall that the Note of the Mission of Australia No. 66/87 of 1 July 1987, on behalf of the States Parties to the Antarctic Treaty, addressed the same issue. The Note continues to reflect their position on this question.

6. The statement made on behalf of all States Parties to the Antarctic Treaty by the Permanent Representative of Germany in the plenary session at the forty-seventh United Nations General Assembly on 9 December 1992, expressed, inter alia, the opinion of the Antarctic Treaty Parties that consensus is the only constructive basis of considering Antarctic issues, and that the General Assembly, in considering the question of Antarctica, should therefore return to consensus. That remains the conviction of the Antarctic Treaty Parties.

Panama

[Original: Spanish]

[3 June 1993]

1. The Republic of Panama, concerned about the deterioration of the global environment, welcomes the establishment of Antarctica as a "nature reserve or world park", in order to keep Antarctica demilitarized, out of the arms race and free from nuclear weapons, thus ensuring the protection and conservation of its ecosystems for the benefit of mankind.

2. Panama believes that the scientific research stations should be coordinated, in order to avoid duplication that endangers Antarctica's ecosystems. At the same time, a supervisory committee should be established to monitor the research work of scientific expeditions, in order to ensure that the

waste resulting from their research is removed and stored in places where it does not endanger the environment. The Republic of Panama supports the objectives of chapter 17 of Agenda 21 on Antarctica regarding the need to continue to "enhance access of the international scientific community and specialized agencies of the United Nations to such data and information, including the encouragement of periodic seminars and symposia". a/

3. Panama reiterates, as on previous occasions, that pending the establishment of a non-racial, democratic government in South Africa, the apartheid minority regime of that country should not be allowed to participate in the meetings of the Antarctic Treaty Consultative Parties.

Notes

a/ Report of the United Nations Conference on Environment and Development, Rio de Janeiro, 3-14 June 1992, vol. I, Resolution adopted by the Conference (United Nations publication, Sales No. E.93.I.8, vol. I and Corr.1), para. 17.104 (b).